

WHAT IS CLAIMED IS:

1. A flow-through rotary damper assembly, comprising:
a cylindrical outer body member defining a first aperture and a second aperture in an outer wall thereof, the first and the second apertures being formed in radial proximity with one another on opposite sides of the cylindrical outer body member;
a cylindrical inner body member rotatably positioned within the cylindrical outer body member, the cylindrical inner body member defining a third aperture and a fourth aperture in an outer wall thereof, the third and fourth apertures being formed in radial proximity with one another on opposite sides of the cylindrical inner body member; and
wherein a radial flow path straight through the assembly is formed when the cylindrical inner body member is rotationally positioned such that the third and fourth apertures are aligned with the first and the second apertures.
2. The flow-through rotary damper assembly of claim 1, further comprising an inlet plenum and an outlet plenum coupled to the cylindrical outer body member in proximity to the first aperture and the second aperture to direct fluid communication therethrough.
3. The flow-through rotary damper assembly of claim 1, further comprising a rotational position sensing mechanism positioned to sense a rotary position of the cylindrical inner body member.
4. The flow-through rotary damper assembly of claim 3, wherein the cylindrical inner body member includes at least one location control cam surface, and wherein the rotational position sensing mechanism comprises a microswitch operatively positioned in relation to and actuated by the at least one location control cam surface.
5. The flow-through rotary damper assembly of claim 4, wherein the at least one location control cam surface is positioned on an end wall of the cylindrical inner body member opposite a driving end wall adapted to be driven by a source of motive power.

6. The flow-through rotary damper assembly of claim 1, further comprising a source of motive power drivably coupled to the cylindrical inner body member.

7. The flow-through rotary damper assembly of claim 6, wherein the source of motive power is a timer motor that is operative to rotate the cylindrical inner body member for a predetermined period of time to position the third and the fourth apertures at a desired rotational position relative to the first and the second apertures.

8. The flow-through rotary damper assembly of claim 1, wherein flow of fluid through the assembly is precluded when the cylindrical inner body member is positioned such that the third and fourth apertures are not in alignment with the first and the second apertures.

9. The flow-through rotary damper assembly of claim 8, wherein the cylindrical inner body member further includes fluid sealing members on an outer surface thereof, the fluid sealing members operative in relation to an inner surface of the cylindrical outer body member to preclude fluid flow between the outer surface of the cylindrical inner body member and the inner surface of the cylindrical outer body member.

10. The flow-through rotary damper assembly of claim 9, wherein the fluid sealing members include longitudinal fluid sealing members and circumferential fluid sealing members.

11. The flow-through rotary damper assembly of claim 1, wherein the cylindrical outer body member further defines a fifth aperture in an end wall thereof, wherein the cylindrical inner body member further defines a sixth aperture in an end wall thereof, and wherein an axial flow path out of the assembly is formed when the sixth aperture is positioned in alignment with the fifth aperture.

12. The flow-through rotary damper assembly of claim 11, wherein the fifth aperture is positioned in one half of the end wall of the cylindrical outer body member and wherein the sixth aperture is positioned in one half of the end wall of the cylindrical inner body member such that alignment of the first aperture with the third aperture results in alignment of the fifth aperture with the sixth aperture to form the axial flow path

13. The flow-through rotary damper assembly of claim 12, wherein alignment of the first aperture with the fourth aperture results in the fifth aperture not being aligned with the sixth aperture thereby precluding axial fluid flow.

14. The flow-through rotary damper assembly of claim 12, wherein non-alignment of the first and second apertures with the third and fourth apertures precludes both radial and axial fluid flow through the assembly.

15. The flow-through rotary damper assembly of claim 11, wherein the cylindrical inner body member includes two fluid guide walls forming the third and the forth apertures and a fluid flow path therebetween, wherein the fifth aperture is positioned in one half of the end wall of the cylindrical outer body member and wherein the sixth aperture is positioned in one half of the end wall of the cylindrical inner body member in the fluid flow path such that alignment of the first aperture with the third aperture results in alignment of the fifth aperture with the sixth aperture to form the axial flow path and such that alignment of the first aperture with the fourth aperture results in the fifth aperture not being aligned with the sixth aperture thereby precluding axial fluid flow.

16. The flow-through rotary damper assembly of claim 15, wherein the cylindrical inner body member further defines a seventh aperture in the end wall thereof positioned outside of the fluid flow path such that rotation of the cylindrical inner body member to a first position to preclude radial flow through the assembly aligns the seventh aperture with the fifth aperture allowing fluid flow through the first aperture and the aligned fifth and seventh apertures, and wherein rotation of the cylindrical inner body member to a

second position to preclude radial flow through the assembly also precludes axial flow through the assembly.

17. The flow-through rotary damper assembly of claim 16, wherein the first position and the second position are displaced one from the other by approximately 180 degrees.

18. The flow-through rotary damper assembly of claim 15, wherein the fluid guide walls are plainer such that the fluid flow path defined therebetween allows for essentially laminar fluid flow through the assembly.

19. A flow-through rotary damper assembly for use in a refrigerator having at least a freezer compartment and a main fresh food compartment, the assembly comprising:

a cylindrical outer body member defining a first aperture adapted to accommodate fluid communication with the freezer compartment and a second aperture adapted to accommodate fluid communication with the fresh food compartment, the first and the second apertures being positioned to allow radial fluid flow through the first aperture and the second aperture without requiring a fluid flow direction change therein;

a cylindrical inner body member rotatably positioned within the cylindrical outer body member, the cylindrical inner body member defining a third aperture and a fourth aperture, the third and fourth apertures being positioned to allow radial fluid flow through the third aperture and the fourth aperture without requiring a fluid flow direction change therein; and

wherein a radial flow path through the assembly is formed when the cylindrical inner body member is rotationally positioned such that the third and fourth apertures are aligned with the first and the second apertures such to accommodate air flow at least between the freezer compartment and the main fresh food compartment without requiring a fluid flow direction change within the assembly.

20. The flow-through rotary damper assembly of claim 19 for use in a refrigerator additionally having a crisper compartment, wherein the cylindrical outer body

member further defines a fifth aperture in an end wall thereof adapted to accommodate fluid communication with the crisper compartment, wherein the cylindrical inner body member further defines a sixth aperture in an end wall thereof, and wherein an axial flow path out of the assembly is formed when the sixth aperture is positioned in alignment with the fifth aperture such that at least the freezer compartment and the crisper compartment are in fluid communication.

21. The flow-through rotary damper assembly of claim 20, wherein the fifth aperture and the sixth aperture are positioned such that alignment of the first aperture with the third aperture results in alignment of the fifth aperture with the sixth aperture to accommodate air flow between the freezer compartment, the main fresh food compartment, and the crisper compartment.

22. The flow-through rotary damper assembly of claim 21, wherein alignment of the first aperture with the fourth aperture results in the fifth aperture not being aligned with the sixth aperture to accommodate air flow between the freezer compartment and the main fresh food compartment while precluding air flow to the crisper compartment.

23. The flow-through rotary damper assembly of claim 22, wherein non-alignment of the first and second apertures with the third and fourth apertures precludes air flow between the freezer compartment, the main fresh food compartment, and the crisper compartment.

24. The flow-through rotary damper assembly of claim 20, wherein the cylindrical inner body member includes two fluid guide walls forming the third and the forth apertures and a fluid flow path therebetween, and wherein the sixth aperture is positioned in the fluid flow path such that alignment of the first aperture with the third aperture results in alignment of the fifth aperture with the sixth aperture to accommodate air flow between the freezer compartment, the main fresh food compartment, and the crisper compartment.

25. The flow-through rotary damper assembly of claim 24, wherein alignment of the first aperture with the fourth aperture results in the fifth aperture not being aligned with the sixth aperture to accommodate air flow between the freezer compartment and the main fresh food compartment and to preclude air flow to the chiller compartment.

26. The flow-through rotary damper assembly of claim 25, wherein the cylindrical inner body member further defines a seventh aperture in the end wall thereof positioned outside of the fluid flow path such that rotation of the cylindrical inner body member to a first position to preclude air flow between the freezer compartment and the main fresh food compartment aligns the seventh aperture with the fifth aperture to accommodate air flow between the freezer compartment and the crisper compartment.

27. The flow-through rotary damper assembly of claim 26, wherein rotation of the cylindrical inner body member to a second position to preclude air flow between the freezer compartment and the main fresh food compartment also precludes air flow between the freezer compartment and the crisper compartment.

28. The flow-through rotary damper assembly of claim 20, wherein the cylindrical inner body member includes two fluid guide walls forming the third and the forth apertures and a fluid flow path therebetween, and wherein the sixth aperture is positioned outside of the fluid flow path such that rotation of the cylindrical inner body member to a first position to preclude air flow between the freezer compartment and the main fresh food compartment aligns the sixth aperture with the fifth aperture to accommodate air flow between the freezer compartment and the crisper compartment.

29. The flow-through rotary damper assembly of claim 19, wherein the cylindrical inner body member includes two plainer fluid guide walls forming the third and the forth apertures and a fluid flow path therebetween such that the fluid flow path defined therebetween allows for essentially laminar air flow through the assembly.

30. A flow-through rotary damper assembly, comprising:

a cylindrical outer body member defining a first aperture and a second aperture in an outer wall thereof, the first and the second apertures being formed in radial proximity with one another on opposite sides of the cylindrical outer body member;

a cylindrical inner body member rotatably positioned within the cylindrical outer body member, the cylindrical inner body member including two plainer fluid guide walls forming a third and a forth apertures and a fluid flow path therebetween such that the fluid flow path defined therebetween allows for essentially laminar air flow through the cylindrical inner body member; and

wherein a flow path through the assembly is formed when the cylindrical inner body member is rotationally positioned such that the third and fourth apertures are aligned with the first and the second apertures, the flow path having a radial inlet and a radial outlet.